

MagViz
Ultra-Low Field Magnetic Resonance Imaging (ULF-MRI)
Call for Commercialization Plans

Commercialization Opportunity

Scientists at Los Alamos National Laboratory's (LANL's) Physics Division have developed a novel imaging technology that is able to create images and probe chemical environments utilizing very weak magnetic fields. This technique, known as Ultra-Low Field Magnetic Resonance Imaging (ULF-MRI), was initially developed at LANL to advance research in brain activity by detecting ultra-weak magnetic fields emanating from the brain. However, ULF-MRI has multiple applications, including medical imaging, food processing and homeland security.

LANL is currently seeking one or more partners that are interested and qualified to commercialize the ULF-MRI technology. LANL is requesting that all potential licensees submit a Letter of Interest, to be received by LANL on or before COB **February 12th, 2010**.

The Letter of Interest is the first stage in a due diligence / selection process that will enable LANL to choose the most qualified licensee(s) for the commercialization of this important technology. Further information regarding the technology and the commercialization process can be found within this document, as well as online at the following web site:

<http://www.lanl.gov/partnerships/license/techs/magviz.shtml>

In order to ensure that all interested parties have received this announcement, we would ask that you please confirm receipt of this email by simply replying to this message. We appreciate your assistance.

LANL Mission

The Technology Transfer Division at Los Alamos National Laboratory is tasked with moving technologies from the laboratory to the marketplace for the benefit of society and the US economy. The MagViz technology has multiple applications in a variety of fields; LANL will be considering licensees in all fields of use for the technology to ensure that this important technology is broadly deployed.

LANL Technology

Ultra-Low Field Magnetic Resonance Imaging (ULF-MRI), also known as MagViz, is an imaging technique that utilizes magnetic fields up to one million times smaller than traditional, high-field (HF) MRI machines currently found in most hospitals. ULF-MRI is enabled by Superconducting Quantum Interference Devices (SQUIDS), ultra-sensitive magnetic field detectors, which eliminate the need for large superconducting electromagnets used in HF MRI units, greatly reducing the size and cost ULF-MRI units. Because it utilizes very small magnetic fields, ULF-MRI is ideal for non-invasive imaging through metal or opaque containers, while retaining the primary strength of traditional MRI: the ability to probe chemical environments as well as provide images.

Initially developed at LANL to advance research in brain activity by detecting ultra-weak magnetic fields emanating from the brain, ULF-MRI has now been applied to multiple applications, including medical imaging, food processing and homeland security.

MRI is a powerful diagnostic tool for soft-tissue anatomy and injuries and is commonly found in hospitals. Its relatively small size and low cost makes ULF-MRI instrumentation ideal for fielded applications, such as battlefields and remote or mobile medical clinics. Additionally, by employing ultra-low magnetic fields, ULF-MRI is safe for use in patients with medical implants, pacemakers or embedded shrapnel because metal objects will not dislodge under the weak magnetic fields, a significant advantage both in the field and in emergency rooms where patient history may not be known.

In addition to anatomical imaging for diagnostic purposes, ULF-MRI provides a new neuroimaging approach which will give researchers a better understanding of the nature of cognition, which in turn could lead to an increased understanding of how the brain works. The same SQUID sensors used in ULF-MRI can be used to detect minute changes in magnetic fields resultant from the presence of brain activity. The combination of neural signal detection with anatomical imaging via ULF-MRI may provide a new imaging tool for studies of the ignition point of visual recognition, cognition, or deception. In addition, the direct imaging of neural activity may lead to new diagnostic tools for neural diseases like epilepsy.

ULF-MRI can also be used to non-invasively investigate the chemical environment inside all types of containers, regardless of material or color, enabling a powerful tool for ensuring the quality and security of food products. For example, ULF-MRI can be used to distinguish between spoiled and unspoiled foods or beverages without opening their containers.

In response to the 2006 terrorist plot to blow up an aircraft with liquid explosive components carried aboard, LANL's ULF-MRI researchers adapted the technology to a crucial national security need: the detection of potential threat substances, especially liquid explosives, at airport screening portals. An operational prototype of this scanning technology, called MagViz, detects liquid explosives in less than 60 seconds, scans multiple containers simultaneously, detects volumes as small as one millimeter, and "sees through" metal containers. The MagViz prototype was tested successfully at the Albuquerque Sunport in December 2008. MagViz discriminates threat objects from benign materials using the same MRI contrast mechanisms used for brain imaging. MagViz is presently one of the only non-invasive techniques that can determine chemical composition in multiple unopened bottles, and through opaque and foil containers, allowing near-real-time screening of passenger luggage. MagViz is able not only to identify potential threat objects, but also determine the exact chemical composition of a liquid, enabling proper response and disposal of threat materials while minimally impacting current airport security screening methods.

Intellectual Property

LANL has developed a portfolio of relevant intellectual property that consists of several patents, patent applications and copyright-protected software related to this invention. This IP portfolio will be available for either exclusive or non-exclusive licensing, depending upon the merits of the commercialization plan, and potential licensee(s)'s anticipated field-of-use for the technology. Additional details regarding the intellectual property portfolio will be provided to interested parties once a Non-Disclosure Agreement has been executed.

Letter of Interest

In response to LANL's previous marketing efforts, a number of organizations have expressed interest in the MagViz technology. LANL will select the most qualified licensee(s) through a competitive call for proposals—the Letter of Interest being the first step in that process.

Your Letter of Interest should include the following information:

- Description of your company and its mission
- Explanation of the company's interest in the technology and its relevance to the company's goals and product offering(s)
- Demonstrated experience in developing and marketing a technology in one or more industries related to ULF-MRI applications
- Brief description of the company's financial and human resources available for commercializing this technology
- Any questions that you would like to have answered during the Commercialization Workshop

LANL Contacts

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Commercialization Process

Once LANL has received your Letter of Interest, we will ask that you execute a bilateral Non-Disclosure Agreement (NDA) with the Laboratory. This will need to be executed prior to LANL Commercialization Workshop, which will be held March 10th, 2010.

The Commercialization Workshop will provide an opportunity for interested parties to learn more about LANL's intellectual property portfolio for MagViz and the commercial opportunities associated with this important technology. A presentation by the inventing scientists will provide technical details and a venue for any technical questions regarding the MagViz technology. There will also be an opportunity for brief, individual break-out sessions as part of the commercialization workshop.

Attendance at the Commercialization Workshop is not mandatory for qualified respondents; however, we believe the Workshop will be very useful. Information provided at the Commercialization Workshop will be sent to any qualified respondent unable to attend the Workshop.

Following the Commercialization Workshop, LANL will send a Commercialization Plan template to each qualified respondent that previously submitted a Letter of Interest, regardless of whether the respondent attended the Commercialization Workshop. The package will include details regarding the following time line: 1) submission date for Commercialization Plans; 2) target date for selection of the most qualified licensee(s); and 3) the negotiation and license execution process. Commercialization plans will be held as company proprietary information and no information from one applicant will be shared with any other.

Commercialization Process:

- Submit **Letter of Interest by February 12th, 2010** to the contacts listed above.
- LANL will contact you to put a bilateral Non Disclosure Agreement in place. **The NDA must be fully executed prior to March 10th, 2010.**
- A Commercialization Workshop will be held March 10th, 2010 to give all interested parties the opportunity to ask questions about both the technology and technology transfer process.
- Submit commercialization plan to LANL.
- Commercialization plans will be reviewed by the LANL selection committee.
- Selected licensee(s) will negotiate license terms with LANL.

Please note the following information in evaluating this commercialization opportunity:

*One or more of the inventing scientists from LANL **may** elect to form a start-up company and compete for a license to the technology, or, they may choose to partner with one or more of the interested respondents. To avoid any possible conflict of interest in the event that this situation materializes, the Laboratory will not share any information from any applicant with the LANL scientists, nor will they be involved in the selection of the final licensee(s). LANL scientists will, however, participate in the commercialization workshop described below to share technical details regarding the LANL technology.*

Licensee Selection Criteria

LANL's license negotiating team will select the most qualified licensee(s) based upon each company's Commercialization Plan and how adequately it meets the general selection criteria set forth below, including the technology commercialization strategy detailed therein. Our goal is to select the company(ies) that are most qualified and have the necessary experience and resources to successfully commercialize the LANL technology. Specific evaluation criteria include, but are not limited to:

- Licensing interest. Exclusive or non-exclusive by specific application or Field-of-Use.
- Technology commercialization strategy (e.g., in-house manufacturing, partnering with industry leaders, sublicensing, etc.)
- Business and marketing plan
- Financial resources that will be dedicated to this commercialization project
- Instrumentation/technical expertise relevant to this technology
- Management team/Product champion

Thank you for your interest in pursuing this commercialization opportunity. If you have any questions or comments, please direct them to Erica Sullivan or Rob Dye (see contact information above). Additional information regarding this technology and the related intellectual property is available at: <http://www.lanl.gov/partnerships/license/techs/magviz.shtml>. We look forward to receiving your Letter of Interest.